DOCUMENT RESUME

ED 068 567 TM 002 048

TITLE	Dietary Aid (hotel & rest.; medical ser.) 317.877-010--Technical Report on Development of USTES Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	S-436
PUB DATE	Jul 69
NOTE	15p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; *Dietitians; Evaluation Criteria; Food Service; Hospitals; Hotels; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity
IDENTIFIERS	Dietary Aid; GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

July 1969 United States Training and Employment Service Technical Report S-436

S-436

ED 068567

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Development of USTES Aptitude Test Battery

for

Dietary Aid

(hotel & rest.; medical ser.) 317.877

U.S. DEPARTMENT OF LABOR
MANPOWER ADMINISTRATION

ED 068567

Technical Report on Development of USTES Aptitude Test Battery For.....

Dietary Aid (hotel & rest.; medical ser.) 317.877-010

S-436

(Developed in Cooperation with the
Alabama State Employment Service)

U. S. Department of Labor
Manpower Administration

July 1969

FOREWARD

The United States Training and Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination, predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

GATB Study 2744

DEVELOPMENT OF USTES APTITUDE TEST BATTERY

For

Dietary Aid (hotel & rest.; medical ser.) 317.887-010

S-436

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Dietary Aid (hotel & rest.; medical ser.) 317.887-010. The following norms were established.

GATB Aptitudes	Minimum Acceptable GATB Scores
G - General Learning Ability	70
P - Form Perception	75
M - Manual Dexterity	70

RESEARCH SUMMARY

Sample:

49 female trainees receiving training in MDTA Dietary Aid course in the Birmingham, Alabama MDTA Center. This study was initiated prior to the requirement of providing minority group information. Therefore, minority group composition is unknown.

Criterion:

Supervisory ratings.

Design:

Longitudinal (tests were administered before training and criterion data collected at the end of training.)

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, aptitude-criterion correlations and selective efficiencies.

Predictive Validity:

Phi Coefficient = .56($p/2 < .0005$)

Effectiveness of Norms:

Only 65% of the nontest-selected trainees used for this study were good trainees; if the trainees had been test-selected with the above norms,

87% would have been good trainees, thirty-five percent of the non-test-selected trainees used for this study were poor trainees; if the trainees had been test-selected with the above norms, only 13% would have been poor trainees. The effectiveness of the norms is shown graphically in Table 1.

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Trainees	65%	87%
Poor Trainees	35%	13%

VALIDATION SAMPLE DESCRIPTION

Size: N=49

Occupational Status: MDTA Trainees

Work Setting: Trainees in a MDTA Dietary Aid training course in Birmingham, Alabama MDTA Center.

Selection Requirements:

Education: None
Previous Experience: None
Tests: No requirement
Other: Selection was based on ability to profit from training as determined by previous work-history, hobbies, interest and ability.

Principal Activities: The job duties for each worker are comparable to those described in the job description in the Appendix.

Minimum Experience: All individuals in the sample were trainees.

TABLE 2

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, and Education.

	Mean	SD	Range	r
Age (years)	19.3	1.1	17-21	.192
Education (years)	10.3	2.1	7-13	.293

EXPERIMENTAL TEST BATTERY

All twelve tests of the GATB, B-1002B were administered to the validation sample during the period of March 8 - September 29, 1967.

CRITERION

The criterion data consisted of instructors' ratings of job proficiency. Ratings were obtained twice (two weeks apart) and correlated. Criterion data were collected on July 25 and December 27, 1967.

Rating Scale: The rating scale, USTES Form SP-21, consisted of nine items covering different aspects of job performance with five alternatives for each item.

Reliability: A reliability coefficient of .88 was obtained between the two ratings. The final criterion consists of the combined scores of the two ratings.

Criterion Score Distribution:

Possible Range	18-90
Actual Range	23-80
Mean:	54.3
Standard Deviation:	14.3

Criterion Dichotomy: The criterion distribution was dichotomized into high and low groups by placing 35% of the sample in the low group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers." The criterion critical score is 51.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of the job duties involved and a statistical analysis of test and criterion data. Aptitude K which does not have a high correlation with the criterion was considered for inclusion in the norms because the sample had a relatively high mean score and a relatively low standard deviation on Aptitude K. Aptitudes N and S which have a significant correlation with the criteria were not selected for inclusion in the trial norms since both aptitudes were rated irrelevant to successful

performance of job duties. Tables 3, 4 and 5 show the results of the qualitative and statistical analyses.

TABLE 3
Qualitative Analysis

(Based on the job analysis, the aptitudes indicated appear to be important to the work performed)

Aptitude	Rationale
G - General Learning Ability	Required for making judgement in planning menus and special diets.
V - Verbal Aptitude	Required to understand written and oral instructions; to communicate with workers and with customers.
M - Manual Dexterity	Required to accomplish tasks of setting and waiting on tables.

Aptitudes N and S were rated irrelevant for performance of job duties.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

Aptitudes	Mean	SD	Range	r
G - General Learning Ability	78.5	13.6	52-105	.545**
V - Verbal Aptitude	84.3	8.3	66-104	.442**
N - Numerical Aptitude	81.2	15.2	52-111	.484**
S - Spatial Aptitude	86.1	17.1	61-124	.476**
P - Form Perception	95.3	18.1	53-132	.448**
Q - Clerical Perception	103.1	14.5	75-148	.307*
K - Motor Coordination	100.9	14.9	76-132	.057
F - Finger Dexterity	94.7	17.4	50-129	.265
M - Manual Dexterity	90.2	17.4	40-132	.339*

*Significant at the .05 level
**Significant at the .01 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data: Important	X	X							X
Irrelevant			O	O					
Relatively High Mean					X	X	X	X	
Relatively Low Standard Dev.	X	X				X	X		
Significant Correlation with Criterion	X	X	X	X	X	X			X
Aptitudes to be Considered for Trial Norms	G	V			P	Q	K		M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of Aptitudes G,V,P,Q, K, and M at trial cutting scores were able to differentiate between the 65% of the sample considered good trainees and the 35% of the sample considered poor trainees. Trial cutting scores at five point intervals one standard deviation below the mean are tried because this will eliminate about one-third of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one-third of the sample. For four-aptitude trial norms, cutting scores of slightly less than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. The optimum differentiation for the occupation of Dietary Aid (hotel & rest.; medical ser.) 317.877-010 was provided by the norms of G-70, P-75 and M-70. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .56 (statistically significant at the .0005 level).

TABLE 6

Predictive Validity of Test Norms, G-70, P-75 and M-70

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good trainees	5	27	32
Poor trainees	13	4	17
Total	18	31	49

Phi Coefficient (ϕ) = .56 Chi Square (χ^2_Y) = 15.2
Significance Level = $P/2 < .0005$

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study did not meet the requirements for incorporating the occupation studied into any of the OAP's included in Section II of the Manual for the General Aptitude Test Battery. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.

SP-21
Rev. 2/61

A-P-P-E-N-D-I-X

DESCRIPTIVE RATING SCALE
(For Aptitude Test Development Studies)

Score____

RATING SCALE FOR _____
D. O. T. Title and Code

Directions: Please read Form SP-20, "Suggestions to Raters", and then fill in the items listed below. In making your ratings, only <u>one</u> box should be checked for each question.

Name of Worker (print) _____
(Last) (First)

Sex: Male_____ Female_____

Company Job Title: _____

How often do you see this worker in a work situation?

☐ See him at work all the time.

☐ See him at work several times a day.

☐ See him at work several times a week.

☐ Seldom see him in work situation.

How long have you worked with him?

☐ Under one month.

☐ One to two months.

☐ Three to five months.

☐ Six months or more.

A. How much work can he get done? (Worker's ability to make efficient use of his time and to work at high speed.)

☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.

☐ 2. Capable of low work output. Can perform at a slow pace.

☐ 3. Capable of fair work output. Can perform at an acceptable but not a fast pace.

☐ 4. Capable of high work output. Can perform at a fast pace.

☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

☐ 1. Performance is inferior and almost never meets minimum quality standards.

☐ 2. The grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.

☐ 3. Performance is acceptable but usually not superior in quality.

☐ 4. Performance is usually superior in quality.

☐ 5. Performance is almost always of the highest quality.

C. How accurate is he in his work? (Worker's ability to avoid making mistakes.)

☐ 1. Makes very many mistakes. Work needs constant checking.

☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.

☐ 3. Makes mistakes occasionally. Work needs only normal checking.

☐ 4. Makes few mistakes. Work seldom needs checking.

☐ 5. Rarely makes a mistake. Work almost never needs checking.

D. How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

☐ 1. Has very limited knowledge. Does not know enough to do his job adequately.

☐ 2. Has little knowledge. Knows enough to "get by."

☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.

☐ 4. Has broad knowledge. Knows enough to do good work.

☐ 5. Has complete knowledge. Knows his job thoroughly.

E. How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

☐ 1. Has great difficulty doing his job. Not at all suited to this kind of work.

☐ 2. Usually has some difficulty doing his job. Not too well suited to this kind of work.

☐ 3. Does his job without too much difficulty. Fairly well suited to this kind of work.

☐ 4. Usually does his job without difficulty. Well suited to this kind of work.

☐ 5. Does his job with great ease. Exceptionally well suited for this kind of work.

F. How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations efficiently.

☐ 3. Can perform several different operations with reasonable efficiency.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

G. How resourceful is he when something different comes up or something out of the ordinary occurs? (Worker's ability to apply what he already knows to a new situation.)

☐ 1. Almost never is able to figure out what to do. Needs help on even minor problems.

☐ 2. Often has difficulty handling new situations. Needs help on all but simple problems.

☐ 3. Sometimes knows what to do, sometimes doesn't. Can deal with problems that are not too complex.

☐ 4. Usually able to handle new situations. Needs help on only complex problems.

☐ 5. Practically always figures out what to do himself. Rarely needs help, even on complex problems.

H. How many practical suggestions does he make for doing things in better ways? (Worker's ability to improve work methods.)

☐ 1. Sticks strictly with the routine. Contributes nothing in the way of practical suggestions.

☐ 2. Slow to see new ways to improve methods. Contributes few practical suggestions.

☐ 3. Neither quick nor slow to see new ways to improve methods. Contributes some practical suggestions.

☐ 4. Quick to see new ways to improve methods. Contributes more than his share of practical suggestions.

☐ 5. Extremely alert to see new ways to improve methods. Contributes an unusually large number of practical suggestions.

I. Considering all the factors already rated, and <u>only</u> these factors, how acceptable is his work? (Worker's "all-around" ability to do his job.)

☐ 1. Would be better off without him. Performance usually not acceptable.

☐ 2. Of limited value to the organization. Performance somewhat inferior.

☐ 3. A fairly proficient worker. Performance generally acceptable.

☐ 4. A valuable worker. Performance usually superior.

☐ 5. An unusually competent worker. Performance almost always top notch.

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FACT SHEET

Job Title: DIETARY AID (hotel & rest.; medical ser.) 317.877-010

Job Summary: Portions and assists in preparation of foods in accordance with special diet requirements as directed by Dietician, and delivers food trays to hospital patients.

Work Performed: Prepares trays, places them on carts or dumbwaiters. Pushes carts to halls or work kitchens: Prepares trays by placing on them such items as silver, fruit juice, sugar, cream, milk, and butter and/or coffee. Places servings in blender to make foods for soft or liquid diets. Apportions foods on trays in accordance with special diet slips, sets up trays to be delivered to special diet patients and those not served at regular meal time. May assemble specified portions and kinds of foods to be delivered to serving kitchens on various floors.

Performs other related duties: Washes dishes and cleans work area, tables, cabinets, etc. May requisition food and supplies from storeroom, based on number and kind of special diets required.

Effectiveness of Norms: Only 65% of the non-test-selected trainees used for this study were good trainees; if the trainees had been test-selected with the S-436 norms, 87% would have been good trainees. Thirty-five percent of the non-test-selected trainees used for this study were poor trainees; if the trainees had been test-selected with the S-436 norms, only 13% would have been poor trainees.

Applicability of S-436 Norms: The aptitude test battery is applicable to jobs which include a majority of the job duties described above.

GPO 883-177

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